

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 10

REMARKS

Claims 1-12 were pending in the present application. By this Amendment, new independent claim 13 has been added, and claim 1 has been amended to clarify the claimed invention. Accordingly, claims 1-13 are pending in the present application, with claims 1, 7 and 13 being in independent form.

Support for the amendment to claim 1 can be found in the application at, for example, page 13, line 31 through page 14, line 1.

Support for new claim 13 can be found in the application at, for example, page 10, line 29, through page 12, line 4.

Rejection under Sect. 112, first paragraph (written description)

On page 2 of the November 4, 2004 final Office Action, claims 1-12 were rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement.

The Examiner stated that the claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The Examiner also stated that this is a new matter rejection.

The Examiner stated that this rejection is maintained for reasons of record. The Examiner further stated that claim 1-12 are original claims, however, they have been substantively amended several times. The Examiner also stated that Applicant has pointed to basis in the appendix (pages A-1 through A-7) to the

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 11

response.

The Examiner stated that comparison of independent claims 1 and 7 alone to the basis pointed to in applicant's chart reveals that basis for the system of claim 1 is premised on Fig. 1 and pages 12-16 and 20-21 of the specification and that basis for the process of claim 1 is premised on pages 10-16 and 20-22 of the specification. The Examiner further stated that the system components and method steps set forth here neither match those of the claims in a broad sense or in particulars.

The Examiner stated that for example, Fig. 1 has all of the components linked to a central control apparatus and genomics database which is not a limitation of the claims. The Examiner further stated that the control apparatus and database are one unit. The Examiner also stated that components 6, 7 and 8 are also linked which is not a limitation of the claims.

The Examiner stated that a fair reading of the specification as originally filed would not convey to one of ordinary skill in the art that what is now claimed was the contemplated invention. The Examiner further stated that Applicant may not recast or repackage the method steps originally contemplated into different combinations after the fact. The Examiner also stated that the presently claimed methods as written are conceptually different from those claims originally filed and the methods disclosed in the specification as filed and the constitute new matter.

The Examiner states in the second paragraph on page 3 of the November 4, 2004 Office Action that additional features must be added to the system claim.

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 12

While Applicants do not concede the Examiner's contention, claim 1 has been amended in this Amendment to clarify the claimed invention described in the claim.

Regarding links between components 6-8 in Figure 1, as pointed out in the specification (see page 22, lines 19-25), it is desirable to use robotics and other automation techniques in the process and system. The links between components 6-8 suggest by way of example that transfer of specimen crystals from component 6 to component 7 and then from component 7 to component 8 may be automated. Automation is not a requirement but an option according to the patent specification.

In addition, it should be noted that the written description rejection was asserted by the Examiner for the first time in the April 26, 2004 Office Action. The April 26, 2004 Office Action did not state any specifics regarding which features of the claimed invention constitutes new matter. Instead, the April 26, 2004 Office Action requested Applicants to identify support in the application for each claim element. In response to the Examiner's request, Applicants submitted a seven page chart citing such support.

The November 4, 2004 Office Action does not set forth any specifics regarding which features of the claimed invention constitutes new matter.

Applicants request the Examiner to identify specifically the features of the claimed invention that the Examiner contends constitute new matter.

Applicants maintain that the claimed invention has not changed

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 13

during the course of prosecution (since the cited art does not require the breadth of the claimed invention to be narrower), and claims 1-12 have been amended (numerous times) to place them in better form for examination, in response to Office Actions which stated that the claims do not clearly define the claimed invention.

Accordingly, withdrawal of the written description rejection of claims 1-12 under 35 U.S.C. §112, first paragraph, is respectfully requested.

Rejection under 35 U.S.C. §112, first paragraph (enablement)

On page 3 of the November 4, 2004 final Office Action, claims 1-12 were rejected under 35 U.S.C. §112, first paragraph, because the specification purportedly does not provide enablement for the breadth of what is encompassed.

The Examiner stated that the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The Examiner stated that claims 1-6 are directed to a system comprising a database, at least one bioinformatics tool, a protein synthesis means having a screening means, a protein processing means, a crystallization means, an X-ray crystallography means, a structure extraction means, and a homology model building tool. The Examiner also stated that the prior Office Action sets forth the reasons that these systems claims do not make clear whether the claimed system is an integrated, turn-key system or fully automated system or whether it embraces discrete components that are not physically,

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 14

structurally, or functionally related.

The Examiner stated that for example, the claims recite no limitations with respect to how the screening means is interrelated or associated with the structure extraction means, if at all. The Examiner further stated that the term "system" does not appear to imply some interrelationship. The Examiner also stated that interpreting the claim using an English language definition, Webster's defines a "system" as "regularly interacting or interdependent group of items forming a unified whole".

The Examiner stated that the prior Office Action sets forth the reasons that claims 1-6 are considered to encompass an integrated, turn-key system and/or fully automated system is not enabled. The Examiner further stated that Applicant is reminded that an adequate disclosure of a device requires details of how complex components are constructed and perform the desired function, particularly if the specification does not detail how the parts should be interconnected and controlled. The Examiner also stated that block diagrams with functional labels do not indicate whether the parts are "off the shelf" or must be specifically constructed or modified for applicant's system.

The Examiner stated that Applicant's arguments regarding beamtime being readily leased by general users are persuasive. The Examiner further stated that there is no argument nor evidence of record that such synchrotron facilities would permit physical, structural, or functional connection with any or all of the devices set forth in the claims.

The Examiner stated that Applicant is requested to explicitly set

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 15

forth on the record what they believe the claimed system is directed to with respect to integration of components or lack thereof.

The Examiner stated that with respect to claims 7-12, the claimed method fails to particularly point out what steps are to be performed and how they are to be performed. The Examiner further stated that this portion of the rejection is maintained for reasons of record.

The Examiner stated that Applicant has argued 35 USC 112, sixth paragraph. The Examiner further stated that the claims have not been treated under 35 USC 112, sixth paragraph. The Examiner also stated that Applicant must show why the claim language invokes 35 USC 112, sixth paragraph, with respect to these claims.

The Examiner stated that Applicant is requested to point to the particular means specified in the written description and equivalents thereof to perform the particular function. The Examiner further stated that it does not appear that the corresponding structure, material, or acts set forth in the written description necessary to perform the function. The Examiner also stated that this decision is not germane to enablement as it addresses indefiniteness under 35 USC 112, second paragraph and in the instant application, the specification is no more illuminating than the claims with regard to the positive, active steps to perform.

In response, Applicants respectfully traverse the rejection.

The issue of whether the claimed system covers an integrated,

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 16

turn-key system or fully automated system is clearly an issue of breadth, not enablement. Thus, the real issue is whether Claim 1 having such a breadth impinges upon the prior art. The Examiner has failed to demonstrate such impingement which would require Applicants to make more narrow the scope of the claimed invention.

Applicants maintain that the application provides an enabling disclosure for such an automated system.

For example, the application, page 22, lines 19-25, states as follows:

At all steps of the process, parallel technology including robotics and other automation may be used. Subject materials may be monitored and logged at each step, and process control data of this kind may be used to optimize the procedures. Records maintained on subjects that do not advance may be used to reinitiate such experiments as advanced procedures are implemented.

The application also includes additional suggestions for using robotics and other automation techniques. See, for example, page 15, lines 19-20, page 16, lines 26-27.

Moreover, use of robotics and automation processes are well-known in the art. Numerous off-the-shelf robotics and automation components are commercially available. Although adaptations and programming may be made, one skilled in the art with the suggestions and guidance provided by this application would readily be able to implement such robotics and automation processes. In addition, implementation may involve assorted designer's choices unaffected by the specifics of the claimed invention.

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 17

Regarding connections to the synchrotron facilities, attached as Exhibit A are computer printouts of web pages regarding facilities at, as one example, the Argonne National Laboratory (ANL) Advanced Photon Source (APS), to the over two thousand users conducting research at the APS. Users can use the existing facilities or submit proposals for construction of new facilities or modification of existing facilities. It is noted that not all components of the system need to be on-site. For example, data can be communicated to and from the APS through one or more computer or other telecommunicative (for example, dial-up or broadband) networks.

The Office Action states that the claimed method of claims 7-12 fails to particularly point out what steps are to be performed (that is, rather than an issue of enablement which requires one to look to the disclosure, the Examiner objects to the claim terms as being indefinite). The issue of particularity of claim terms clearly is one of definiteness for which one looks to claim terms, as opposed to one of enablement for which one looks to the specification for enabling disclosure.

None of the bases in the record for this contention show that a claim term fails to meet the requirements of 35 U.S.C. §112 definiteness. Instead, this contention is based on the premise that not enough details is provided in the claims, or stated another way the claims are too broad. However, breadth is not an issue of indefiniteness. Instead, when breadth is at issue, the question is whether claims having such a breadth impinges upon the prior art. prior art

In sum, the record fails to show that the claims are indefinite or nonenabled.

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 18

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 1-12 under 35 U.S.C. §112, first paragraph.

Rejection under 35 U.S.C. §112, second paragraph

On page 5 of the November 4, 2004 final Office Action, claims 1-12 were rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner stated that "claims 1 and 7 recite 'homologous sequences.'" The Examiner further stated that "it is unclear what level of homology is required to meet the limitation of the claim."

The Examiner stated that claims 1 and 7 recite 'a plurality of target proteins which are members of the family.' The Examiner also stated that "the criteria that define a family are not provided." The Examiner further stated that "it is unclear how a target is selected (what parameters or criteria are used) and how many targets are selected."

The Examiner stated that Applicant argues that various known programs can be used and that one of ordinary skill in the art would not find these two phrases unambiguous and this is unpersuasive. The Examiner also stated that the claims and specification must particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner further stated that Applicant has not provided an art understood meaning for these phrases either within the

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 19

specification or using art recognized documentation.

The Examiner stated that claims 1 and 7 have been amended to recite "which are effective as the target proteins." The Examiner also stated that it is not known what is meant by this phrase. The Examiner further stated that what defines an effective target protein.

The Examiner stated that claims 1 and 7 have been amended to recite "screening products of the synthesis to choose selected synthesized products for processing." The Examiner further stated that "the criteria or parameters for the selection are not provided."

The Examiner stated with respect to claims 1-6, the claimed system does not set forth the relationship of the database, bioinformatics tool, protein synthesis means, protein processing means, crystallization means, X-ray crystallography means, and so forth. The Examiner also stated that the claim language does not reflect an integrated or turn-key system where the components are related or linked to each other in some fashion. The Examiner further stated that as written, the claim appears to be directed to a collection of laboratory equipment or machines.

The Examiner stated that a collection of laboratory equipment or machines does not define a system. The Examiner also stated that Applicant's response on page 18 indicates that the claim is not limited to a turn-key system.

The Examiner stated that with respect to claims 7-12, the method steps as written are internally inconsistent and unclear. The Examiner also stated that for example, in step (a) the database

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 20

has sequence information for a first plurality of proteins and structural information and function information for a second plurality of proteins. The Examiner further stated that in step (g), the refined model is stored in the database.

The Examiner stated that part (a) does not require that the structural information include a refined model or a homology model. The Examiner also stated that in step (j), the database is updated to link the refined model to other databases. The Examiner further stated that part (a) does not require that the database have links to any information at all.

Applicants traverse the rejection as follows.

As previously noted, all of the bases provided by the Examiner under the rubric of "indefiniteness" actually solicit claim amendments to limit the claims. However, breadth of claim cannot support an indefiniteness rejection.

MPEP 2173.04, states that "[b]readth of a claim is not to be equated with indefiniteness. *In re Miller*, 441 F.2d 689, 169 USPQ 597 (CCPA 1971). If the scope of the subject matter embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. 112, second paragraph."

For example, regarding the terms "homologous sequences" the Examiner clearly understands the term, but the Examiner states that the claim must recite in addition the level of homology, in order to further limit the claim. The Examiner has entirely and consistently failed to address the points that Applicants have

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 21

previously provided.

For example, Applicants have previously pointed out in the record regarding level of homology and criteria for a family that the application provides, for example, the following additional guidance at page 14, lines 3-16:

"Three dimensional structural information may be exploited in conjunction with recent advances in amino acid sequence analysis to construct the database. Advanced bioinformatics tools 2 are used to cluster all known gene products into families of homologous sequences. The clustered gene products are typically similar at approximately 30% identity, <0.001 probability of error. The structure of a representative member for each and every family is determined. The protein classes may include whole proteins, domains or sequence motifs that may or may not correspond to independent modules. The unsolved members, which probably constitute the majority, of each family may be visualized by homology modeling based on the known structures of family representatives, as described below."

In addition, regarding "a plurality of target proteins which are members of family" the claims specify that the members of a family have homologous sequences. Applicants have made these points previously and the Examiner has neither acknowledged nor addressed these points.

As Applicants have also previously pointed out in the record, patent claims define the bounds, but not necessarily the details, of the claimed invention. That is, patent claims need not teach one of ordinary skill in the art how to practice the claimed invention which is the function of the specification (rather than the claims).

Regarding "synthesized products which are effective as the target proteins" and "screening products of the synthesis to choose selected products for processing", it is well known (and

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 22

conventionally known) to one skilled in the art that not all of the products of a protein synthesis process (for example, cloning, chemical synthesis, etc.) are necessarily the target protein. For example, one would conventionally screen for expression the constructs resulting from a cloning process. Similarly, one would screen (or filter) the products of chemical synthesis which may include constructs other than the target protein. Thus, one skilled in the art (who by definition knows and/or are in possession of the conventional art) would clearly understand the claim terms, without further elaboration in the claim.

With respect to system claims 1-6, contrary to the contention in the Office Action, the claim elements do have a functional relationship. Contents of the database are used by the bioinformatics tool to cluster proteins into families. For each such family determined by the bioinformatics tool, the protein synthesis means synthesizes target proteins which are members of that family. The protein processing means processes selected products synthesized by the protein synthesis means. The crystallization means crystallizes synthesized products processed by the protein processing means, to produce specimen crystals. The X-ray crystallography performs crystallography on crystals produced and selected by the crystallization means. Thus, it is clear that the claim elements are linked by their respective functional roles. This has previously been pointed out in the record, and the Examiner has neither acknowledged nor addressed the points made by Applicants.

Regarding method claims 7-12, it is clear from the specification that the database may have sequence and structural information for a protein for not functional information for the protein.

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 23

Thus, the "first plurality of proteins" is not identical to the "second plurality of proteins". This distinction does not require partitioning of the database. For example, in a relational database, the functional information field for a protein which is one of the "first plurality of proteins" and not one of the "second plurality of proteins" will simply be empty or null (or some equivalent representation).

Regarding the contents of the database, the Examiner appears to fail to understand (notwithstanding the guidance provided in the specification) that the content of the database is dynamic. That is, as information is collected (for example, structural information, atomic models, refined model, homology models, functional information, etc.) the information is used to update the database. Database update can include replacing old information, adding new information to an existing field, creating a new database field or object, adding links to information elsewhere, etc. Applicants find no inconsistency amongst steps (a), (g), (j) or any other recited step.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 1-12 under 35 U.S.C. §112, second paragraph.

Rejection Under 35 U.S.C. §102(a)

On page 7 of the November 4, 2004 Office Action, claims 1-12 were rejected under 35 U.S.C. §102(a) as allegedly anticipated by knowledge of others in this country before the invention thereof by Applicant, as purportedly evidenced by

- (1) the Workshop on Structural Genomics held at Argonne National Laboratories held January 1998,
- (2) National Institute of General Medical Sciences (NIGMS)

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 24

- Protein Structure Initiative (PSI) held April 24, 1998
(hereinafter "the NIGMS PSI paper"),
(3) NIGMS Genomics Project Planning Meeting held November 24,
1998,
(4) Structural Genomics Meeting held October 1998 in Avalon,
New Jersey,
(5) Shapiro et al. (Current Biology, 15 March 1998), and
(6) Gaasterland (Nature Biotechnology, July 1998).

The Examiner stated that this rejection is maintained for reasons of record. The Examiner further stated that Applicant continues to argue with respect to publication dates. The Examiner also stated that the effective filing date of the instant application is January 22, 1999.

The Examiner stated that Shapiro and Gaasterland are prior art by publication date. The Examiner further stated that the remaining references are applied for what they collectively teach was known in the art at the time of the invention.

The Examiner stated that 35 USC 102(a) is not limited to description in a printed publication before the invention thereof by the applicant for patent. The Examiner also stated that it includes whether the invention was known by others in this country before the invention thereof by the applicant for a patent. The Examiner further stated that the fact that this meeting (as well as the other meeting cited above and publication discussing the meetings cited above) took place or were published prior to applicant's filing date indicates that the invention was known. The Examiner also stated the content of what was discussed at each of these meetings prior to the filing date of the invention has not been rebutted by Applicants.

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 25

The Examiner stated that exhibits presented from inventor Hendrickson support the Examiner's position as set forth in the prior office action. The Examiner further stated that Applicants argue with respect to enabling disclose. The Examiner also stated that is it not clear from the arguments what they are arguing is not enabled.

The Examiner stated that with respect to the system of claims 1-6, applicant continues to argue with respect to the interpretation of the term "system" in claims 1-6. The Examiner further stated that according to Webster's dictionary a system is "a regularly interacting or interdependent group of items forming a unified whole". The Examiner also stated that this is the basis for the Examiner's questioning under 112, first and second paragraph, as to how the recited components in the system of claims 1-6 are supposed to be linked or integrated, whether the intent was a turn-key system or discrete and independent components.

The Examiner stated that these claims do not require that the output from means must be in a form to act directly, automatically, seamlessly, or otherwise, as input for the next means. The Examiner further stated that each of these discrete components (a database with sequence, structural, and functional information; at least one bioinformatics tool capable of clustering; protein synthesis means with screening means; protein processing means; crystallization means; X-ray crystallography means; structure extraction means able to build a refined model; and a homology building tool) having the functionality required by the claims, would have been discussed at these various meetings and thus the system as claimed would have been known.

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 26

The Examiner stated that the embodiment of the system where the components are integrated to the degree that the output of one means could be used by another means, for example the protein synthesized by the protein synthesis means used by the crystallization means, would also clearly have been known. The Examiner further stated that the use of multiple known methodologies in combination to solve the structural genomics problem was clearly known at the time of the invention.

Applicants traverse the rejection.

The rejection is based on references (1) through (5) representing six separate and distinct pools of knowledge.

As previously pointed out in the record, it is well-established that anticipation under 35 U.S.C. §102 requires that each and every feature of a claimed invention must be disclosed in a single reference. It is impermissible to base a rejection under 35 U.S.C. §102 on multiple references disguised as "knowledge by others".

The Examiner has not specified where each and every feature of the claimed invention can be found in a single reference. Absent such a showing, the rejection cannot stand.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 1-12 under 35 U.S.C. §102(a).

Rejection under 35 U.S.C. §102(f)

On page 9 of the November 4, 2004 final Office Action, claims 1-

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 27

12 were rejected under 35 U.S.C. §102(f) because the applicant purportedly did not invent the claimed subject matter in view of

- (a) the Workshop on Structural Genomics held at Argonne National Laboratories held January 1998,
- (b) NIGMS PSI meeting held April 24, 1998,
- (c) NIGMS Genomics Project Planning Meeting held November 24, 1998,
- (d) Structural Genomics Meeting held October 1998 in Avalon, New Jersey, and
- (e) Gaasterland.

The Examiner stated that this rejection is maintained for reasons of record.

The rejection is based on references (a) through (e) representing five separate and distinct disclosures.

As previously pointed out in the record, it is well-established that anticipation under 35 U.S.C. §102 requires that each and every feature of a claimed invention must be disclosed in a single reference.

The Office Action simply has not demonstrated that the claimed invention was known or made by another (i.e. a single reference) prior to when the invention was made by Applicants. The Examiner has not specified where each and every feature of the claimed invention can be found in a single reference. Absent such a showing, the rejection cannot stand.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 1-12 under 35 U.S.C. §102(f).

Wayne A. Hendrickson and Barry Honig
Serial No.: 09/235,986
Filed: January 22, 1999
Page 28

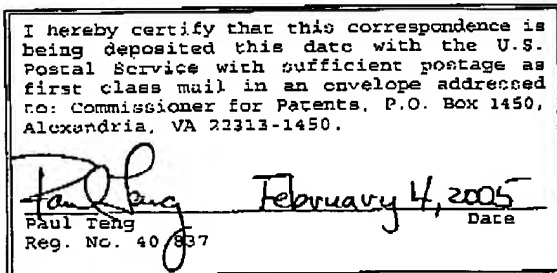
In view of the remarks hereinabove, Applicants maintain that claims 1-13 are now in condition for allowance. Accordingly, Applicants earnestly solicit the allowance of claims 1-13.

If a telephone interview would be of assistance in advancing prosecution of the present application, Applicants' undersigned attorney invites the Examiner to telephone him at the telephone number provided below.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition, and the Commissioner is authorized to charge the requisite fees to our Deposit Account No. 03-3125.

No fee is deemed necessary in connection with the filing of this response. However, if any additional fee is required, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

Respectfully submitted,



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